

What is claimed is:

1. A method for deploying a percutaneous medical instrument,  
comprising the steps of:

5 providing a guidewire and a support wire, the support wire having a distal  
region, a wire guide mounted on the distal region, and an expandable filter mounted on  
the distal region;

advancing the guidewire into a region of interest within a vessel;

advancing the support wire along the guidewire with the wire guide of the  
support wire engaging the guidewire;

10 expanding the filter downstream of the region of interest; and

advancing the percutaneous medical instrument over the support wire and  
positioning the medical instrument within the region of interest.

2. The method of claim 1, further comprising the step of removing  
the guidewire from the vessel.

15 3. The method of claim 1, wherein the region of interest is within a  
coronary artery.

4. The method of claim 1, wherein the region of interest is within a  
carotid artery.

5. The method of claim 1, wherein the region of interest contains atheromatous plaque.

6. The method of claim 1, wherein the wire guide comprises a ring having an aperture adapted to receive the guidewire.

5 7. The method of claim 1, wherein the percutaneous medical instrument is an angioplasty catheter.

8. The method of claim 1, wherein the percutaneous medical instrument is a stent-deployment catheter.

9. The method of claim 8, wherein the stent-deployment catheter  
10 comprises a sheath disposed about a self-expanding stent.

10. The method of claim 1, wherein the percutaneous medical instrument is an atherectomy catheter.

11. The method of claim 1, wherein the percutaneous medical instrument is an aspiration catheter.

15 12. The method of claim 7, further comprising the step of inflating the angioplasty balloon at the region of interest, wherein embolic material is captured by the filter.

13. The method of claim 8, further comprising the step of expanding the stent at the region of interest, wherein embolic material is captured by the filter.

14. The method of claim 1, further comprising the step of:  
contracting the filter; and  
5 removing the support wire from the vessel.

15. The method of claim 1, further comprising the step of removing the percutaneous medical instrument from the vessel.

16. The method of claim 1, wherein the expandable filter comprises a plurality of struts and a mesh disposed about the struts.

10 17. The method of claim 1, wherein the filter expands to the shape of an eggbeater.

18. The method of claim 1, further comprising the step of exchanging one percutaneous medical instrument for another.

19. A percutaneous filter system, comprising:  
a guidewire;  
a support wire having a proximal end, a distal end, and a distal region, the  
support wire adapted to receive a percutaneous medical instrument;  
5 an expandable filter mounted on the distal region of the support wire; and  
a wire guide mounted on the distal region of the support wire and  
slideably engaging the guidewire,  
wherein, during use, the guidewire is positioned in a vessel at a region of  
interest, and the support wire is advanced along the guidewire until the filter reaches the  
10 region of interest.

20. The system of claim 19, wherein the expandable filter is manually  
activated.

21. The system of claim 19, wherein the expandable filter is self-  
15 activating.

22. The system of claim 19, wherein the wire guide comprises a ring  
having an aperture adapted to receive the guidewire.

23. The system of claim 19, wherein the expandable filter comprises a  
plurality of struts and a mesh disposed about the struts.

24. The system of claim 23, wherein the mesh is woven.

25. The system of claim 23, wherein the mesh is a thin film having holes to allow fluid flow.

26. The system of claim 19, wherein the filter expands to the shape of an eggbeater.

27. The system of claim 19, further comprising a percutaneous medical instrument selected from the group consisting of an angioplasty catheter, a stent-deployment catheter, an atherectomy catheter, intravascular ultrasound catheter, and an aspiration catheter.

28. The system of claim 27, wherein the stent-deployment catheter comprises a sheath disposed about a self-expanding stent.

29. The method of claim 1, wherein the wire guide is mounted on the support wire within the filter.

30. The method of claim 1, wherein the wire guide is mounted on the support wire distal the filter.

31. A percutaneous filter system, comprising:

a guidewire;

a support wire having a proximal end, a distal end, a distal region, and an expandable filter mounted on the distal region of the support wire, the support wire  
5 adapted to receive a percutaneous medical instrument; and

a sheath which removeably covers the support wire and filter, the sheath having a proximal end, a distal end, and a distal region, the distal region having a lumen which receives the filter and an aperture adapted to pass the guidewire,

wherein, during use, the guidewire is positioned in a vessel at a region of  
10 interest, the sheath carrying the support wire is advanced along the guidewire until the filter reaches the region of interest, and the sheath is withdrawn to expose the filter.

32. The filter system of claim 31, wherein the lumen of the sheath extends from the distal region to the proximal end.

33. The filter system of claim 31, wherein the sheath comprises an  
15 elongate member having a cylindrical segment at a distal end of the elongate member, wherein the distal region of the sheath comprises the cylindrical segment.

34. The filter system of claim 31, wherein the aperture communicates with the lumen of the sheath.

35. A method for deploying a percutaneous medical instrument,  
comprising the steps of:

providing a guidewire, a support wire, and a sheath, the support wire  
having an expandable filter mounted on the distal region, the sheath covering the  
5 expandable filter;

advancing the guidewire into a region of interest within a vessel;

advancing the sheath and the support wire along the guidewire with the  
sheath engaging the guidewire;

withdrawing the sheath from the expandable filter;

10 expanding the filter downstream of the region of interest; and

advancing the percutaneous medical instrument over the support wire and  
positioning the medical instrument within the region of interest.

36. The method of claim 35, wherein the sheath engages the guidewire  
through an aperture in a distal region of the sheath.

15 37. The method of claim 35, wherein the step of withdrawing the  
sheath from the expandable filter comprises retracting the sheath proximally.

38. The method of claim 35, wherein the step of withdrawing the  
sheath from the expandable filter comprises advancing the sheath distally.

39. The method of claim 35, further comprising the step of removing the sheath from the vessel.

40. The method of claim 31, wherein the aperture is located 10cm from the distal end of the sheath.

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